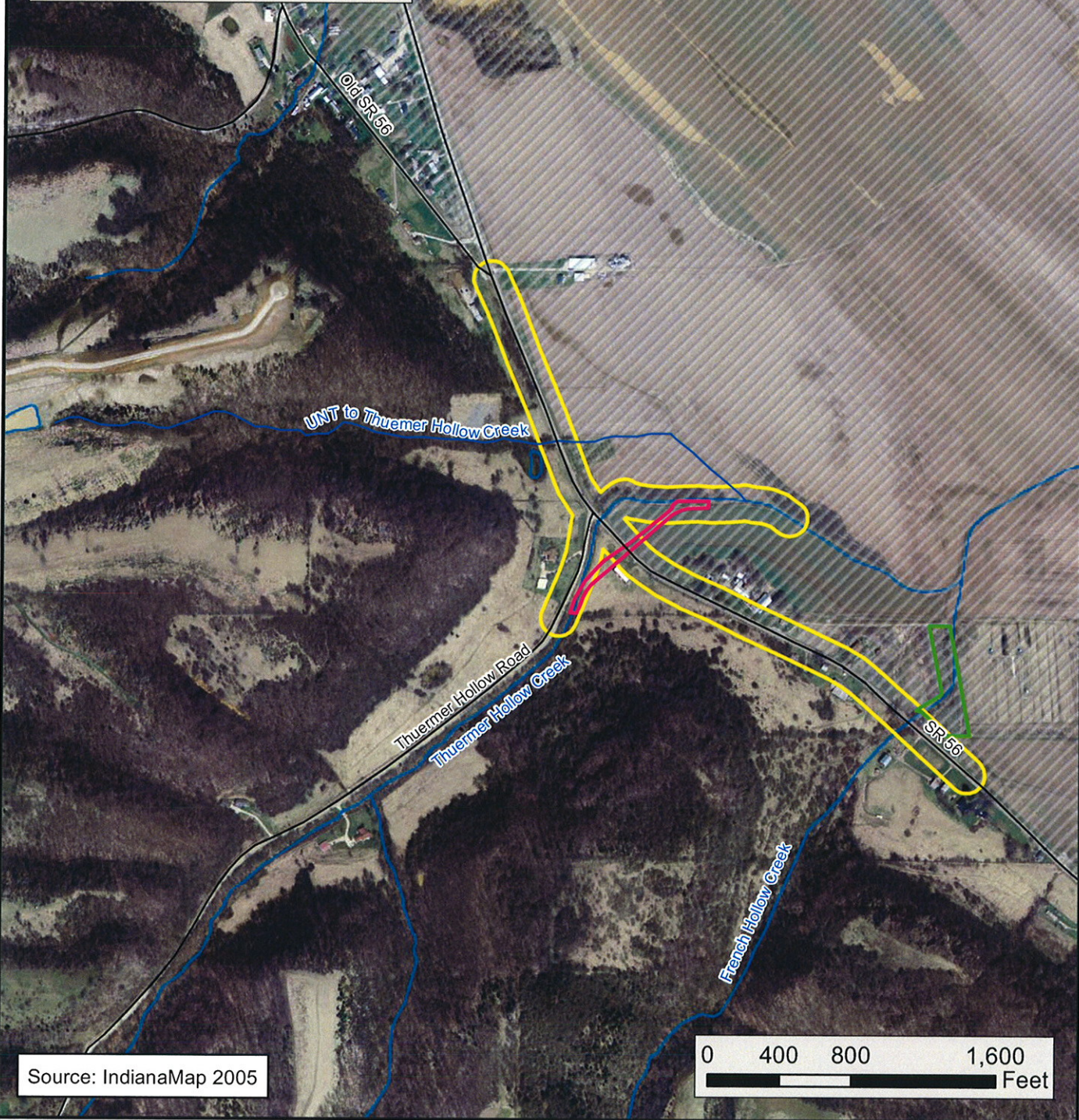


- Stream and Rivers
- Site M-1
- Site M-2
- FEMA 100-Year Flood Zone
- SR 56 Phase C



Source: IndianaMap 2005

0 400 800 1,600 Feet



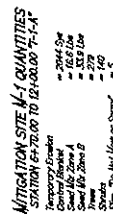
FEMA 100-Year Floodplain Map

Applicant:
Indiana Department of Transportation
100 North Senate Avenue
Indianapolis IN 46204

SR 56 Reconstruction Phase C

Location: City of Rising Sun
Township: Randolph
County: Ohio
State: Indiana

Date: 1/17/2011



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MITIGATION SITE M-1

Description

This work shall consist of furnishing, delivering, and planting either or both plain and mulched seeding, trees, and shrubs. This work includes furnishing and placing seed, inoculants, topsoil, and mulch in a prepared seed bed. This work shall also consist of the performance of incidental planting procedures and plant establishment work to provide a complete operation in accordance with 105.03. This work shall also consist of stockpiling native stone substrate from the existing Thuermer Hollow Creek and placement in the relocated Thuermer Hollow Creek, and backfilling abandoned portions of Thuermer Hollow Creek from approximate STA 3+50 to STA 10+50 Line "T-1-A" (approximately 900 LFT). Contractor shall perform grading of the backfilled channel such that positive drainage will be provided.

Materials

Materials shall be in accordance with the following:

Top Soil	914.01
Water	914.09(a)

Seed shall be in accordance with 914.04 as applicable and shall be Pure Live Seed from approved nurseries within the Plant Hardiness Zones 4, 5, and 6. Seed must be source identified by the Indiana Crop Improvement Association through the Yellow Tag certification program. Origin and care of seeds shall follow the Indiana Seed Law as described in IC 15-15-1.

Erosion Control Blankets shall consist of a machined produced mat consisting of at least 90% of the total dry mass being clean straw from agricultural crops, with the exception that up to 30% of the total dry mass may be coconut fibers in lieu of an equal percentage of straw. Paper or paper related products shall not be permitted as components in the erosion control blanket. The straw shall be evenly distributed throughout the mat to form a thickness of 1/2 in. +/- 1/8 in. The top and bottom sides of the blanket shall be covered with a photodegradable/biodegradable plastic mesh (3.0 LBS/1,000 SFT top and 1.50 LBS/1,000 SFT bottom). The 2 mesh layers shall be substantially adhered to the straw by a knitting process using photodegradable/biodegradable thread. The rolls shall be packaged with suitable protection for outdoor storage at a construction site in a manner which protects them from biodegradation prior to use. The average dry mass of the straw shall not be less than 0.5 LBS/SYS. The minimum roll width shall be 6 FT.

Turf Reinforcement Mats shall consist of a machined produced mat consisting of a minimum 30% coconut, maximum 70 % straw, fiber matrix. Paper or paper related products shall not be permitted as components in the mat. The coconut/straw fiber matrix shall be distributed evenly throughout the mat at a rate of 0.50 LBS/SYD. The turf reinforcement mat shall have a permanent UV stabilized black top net distributed at a minimum 5.0 LBS/1000 SFT, a center net distributed at 24.0 LBS/1000 SFT, and a bottom net distributed at 5.0 LBS/1000 SFT. The rolls shall be packaged with suitable protection for outdoor storage at a construction site in a manner which protects them from degradation prior to use. The minimum roll width shall be 6 FT. Follow all manufacturers' installation recommendations for staple patterns, staple lengths, and/or anchoring techniques. Alternates shall be rated for permissible velocities of no less than 9.0 FT/SEC for bare soil conditions. Alternates are subject to approval by the Engineer.

Mulch shall consist of wheat, rye, or oat straw. All mulch shall be reasonably free from primary noxious weeds in accordance with 914.04.

Tree(t) species shall be planted at a rate of 1 per 144 SFT (12 FT on center spacing). Shrub/Understory(s) species shall be planted at a rate of 1 per 288 SFT (Roughly 17 FT on center spacing). Species and quantity shall be installed according to the following:

Species	Common Name	Quantity
<i>Acer rubrum</i> (t)	red maple	62
<i>Aesculus glabra</i> (t)	Ohio buckeye	62
<i>Asimina triloba</i> (s)	common paw paw	43
<i>Carya laciniosa</i> (t)	shellbark hickory	61
<i>Cornus alternifolia</i> (s)	alternate-leaf dogwood	43
<i>Cornus racemosa</i> (s)	gray dogwood	43
<i>Ilex verticillata</i> (s)	winterberry	44
<i>Lindera benzoin</i> (s)	common spicebush	43
<i>Quercus bicolor</i> (t)	swamp white oak	61
<i>Quercus macrocarpa</i> (t)	bur oak	61
<i>Quercus palustris</i> (t)	pin oak	62
<i>Quercus shumardii</i> (t)	Shumard oak	61

Tree and shrub planting areas shall be planted with 1-0(1-year) or older air root pruning system container-grown saplings with a dense fibrous root system. The container saplings shall be grown in three- or five-gallon containers or larger. Container saplings shall be a minimum of 3 feet tall with a caliper diameter greater than 3/8-inch. Container saplings shall be selected from the previous list of acceptable species. Substitutions shall be approved by the Engineer.

Trees and shrubs shall be obtained from licensed nursery sources in accordance with Section 914.08 of the INDOT Standard Specifications. A list of suppliers will be furnished to the Owner for approval prior to ordering plant material. All trees and shrubs will be in accordance with Sections 914.08(d) and (e) of the INDOT Standard Specifications. Only that number of trees and shrubs that can reasonably be planted during a single day may be removed from storage. All trees and shrubs will be kept moist during transportation and storage. Trees and shrubs will not be subjected to freezing, drying, or excessive warming.

Seed Mix, Slope Stabilization shall be planted in all areas marked "Seed Mix, Zone A" and applied at a rate of 39.30 LBS/Acre and consist of the following:

Seed Mix, Slope Stabilization (Zone A)		
Scientific Name	Common Name	Oz./Acre
<i>Alisma</i> spp.	water plantain mix	1.00
<i>Andropogon gerardii</i>	big bluestem	24.00
<i>Asclepias incarnata</i>	swamp milkweed	2.00
<i>Aster novae-angliae</i>	New England aster	0.50
<i>Bouteloua curtipendula</i>	side-oats grama	16.00
<i>Carex comosa</i>	bristly sedge	2.00
<i>Carex cristatella</i>	crested oval sedge	1.00
<i>Carex lurida</i>	bottlebrush sedge	2.50

<i>Carex spp.</i>	prairie sedge mix	4.00
<i>Carex vulpinoidea</i>	brown fox sedge	4.00
<i>Coreopsis tripteris</i>	tall coreopsis	1.00
<i>Elymus canadensis</i>	Canada wild rye	18.00
<i>Elymus virginicus</i>	Virginia wild rye	12.00
<i>Eupatorium maculatum</i>	spotted Joe-pye weed	0.25
<i>Glyceria striata</i>	fowl manna grass	1.00
<i>Iris virginica</i>	blue flag	4.00
<i>Liatris spicata</i>	marsh blazing star	1.00
<i>Lobelia cardinalis</i>	cardinal flower	0.25
<i>Lobelia siphilitica</i>	great blue lobelia	0.50
<i>Lycopus americanus</i>	common water horehound	0.25
<i>Panicum virgatum</i>	switch grass	12.00
<i>Sagittaria latifolia</i>	common arrowhead	0.75
<i>Schizachyrium scoparium</i>	little bluestem	32.00
<i>Scirpus atrovirens</i>	dark green rush	2.00
<i>Scirpus cyperinus</i>	wool grass	0.50
<i>Silphium terebinthinaceum</i>	prairie dock	1.00
<i>Sorghastrum nutans</i>	Indian grass	20.00
<i>Spartina pectinata</i>	prairie cord grass	3.00
<i>Verbena hastata</i>	blue vervain	1.50
<i>Zizia aurea</i>	golden Alexander's	0.75
	Sub-Total	168.75
Temporary Cover		
<i>Avena sativa</i>	Common Oat	460.00
	Sub-Total	460.00
	Total Oz./Acre	628.75
	Total Lbs./Acre	39.30

Seed Mix, Native shall be planted in all areas marked "Seed Mix, Zone B" and applied at a rate of 37.03 LBS/Acre and consist of the following:

Seed Mix, Native (Zone B)		
Scientific Name	Common Name	Oz./Acre
<i>Andropogon gerardii</i>	big blue stem	40.00
<i>Angelica atropurpurea</i>	great angelica	1.00
<i>Aster ericoides</i>	heath aster	2.50
<i>Aster puniceus</i>	bristly aster	0.75
<i>Aster umbellatus</i>	flat-top aster	0.25
<i>Calamagrostis canadensis</i>	blue joint grass	5.10
<i>Campanula americana</i>	tall bellflower	0.25
<i>Carex crinita</i>	fringed sedge	2.00
<i>Carex lurida</i>	bottlebrush sedge	1.50

<i>Carex squarrosa</i>	narrow-leaved cattail sedge	1.00
<i>Carex vulpinoidea</i>	brown fox sedge	4.00
<i>Elymus virginicus</i>	Virginia wild rye	10.00
<i>Helenium autumnale</i>	sneezeweed	2.00
<i>Heracleum lanatum</i>	cow parsnip	0.75
<i>Leersia oryzoides</i>	rice cut grass	2.00
<i>Lobelia siphilitica</i>	great blue lobelia	1.50
<i>Lycopus americanus</i>	common water horehound	0.25
<i>Mimulus ringens</i>	monkey flower	1.25
<i>Monarda fistulosa</i>	prairie bergamot	1.00
<i>Panicum virgatum</i>	switch grass	2.50
<i>Polygonum spp.</i>	smartweed mix	0.50
<i>Ratibida pinnata</i>	yellow coneflower	4.40
<i>Rudbeckia hirta</i>	black-eyed Susan	1.90
<i>Rudbeckia laciniata</i>	wild golden glow	2.50
<i>Rudbeckia subtomentosa</i>	sweet black-eyed Susan	1.60
<i>Silphium laciniatum</i>	compass plant	3.80
<i>Silphium terebinthinaceum</i>	prairie dock	2.50
<i>Solidago juncea</i>	early goldenrod	2.50
<i>Solidago rigida</i>	stiff goldenrod	2.50
<i>Solidago rugosa</i>	rough goldenrod	3.20
<i>Sorghastrum nutans</i>	Indian grass	2.50
<i>Spartina pectinata</i>	prairie cord grass	7.60
<i>Verbesina alternifolia</i>	wingstem	14.00
<i>Vernonia altissima taeniotricha</i>	hairy tall ironweed	3.80
	Sub-Total	132.90
Temporary Cover		
<i>Avena sativa</i>	Common Oat	460.00
	Sub-Total	460.00
	Total Oz./Acre	592.90
	Total Lbs./Acre	37.06

Comparable seed mixes to those listed above may be substituted with the approval of the Engineer. Each species specified shall be applied at a rate equal to or greater than that listed in the mixtures unless approved by the engineer. If a species listed in the seed mixture is not available notify the engineer and present a proposal for the use of a substitute species.

Construction Requirements

Preparation of the ground before seeding shall be in accordance with 621.03 as applicable and as follows below.

MITIGATION SITE M-2

Description

This work shall consist of furnishing, delivering, and planting either or both plain and mulched seeding, trees, and shrubs. This work includes furnishing and placing seed, inoculants, and topsoil in a prepared seed bed. This work shall also consist of the performance of incidental planting procedures and plant establishment work to provide a complete operation in accordance with 105.03.

Materials

Materials shall be in accordance with the following:

Top Soil	914.01
Water	914.09(a)

Seed shall be in accordance with 914.04 as applicable and shall be Pure Live Seed from approved nurseries within the Plant Hardiness Zones 4, 5, and 6. Seed must be source identified by the Indiana Crop Improvement Association through the Yellow Tag certification program. Origin and care of seeds shall follow the Indiana Seed Law as described in IC 15-15-1.

Erosion Control Blankets shall consist of a machined produced mat consisting of at least 90% of the total dry mass being clean straw from agricultural crops, with the exception that up to 30% of the total dry mass may be coconut fibers in lieu of an equal percentage of straw. Paper or paper related products shall not be permitted as components in the erosion control blanket. The straw shall be evenly distributed throughout the mat to form a thickness of 1/2 in. +/- 1/8 in. The top and bottom sides of the blanket shall be covered with a photodegradable/biodegradable plastic mesh (3.0 LBS/1,000 SFT top and 1.50 LBS/1,000 SFT bottom). The 2 mesh layers shall be substantially adhered to the straw by a knitting process using photodegradable/biodegradable thread. The rolls shall be packaged with suitable protection for outdoor storage at a construction site in a manner which protects them from biodegradation prior to use. The average dry mass of the straw shall not be less than 0.5 LBS/SY. The minimum roll width shall be 6 FT.

Herbicide shall be a glyphosate based product certified for use on aquatic and wetland sites.

Tree(t) species shall be planted at a rate of 1 per 144 SFT (12 FT on center spacing). Shrub/Understory(s) species shall be planted at a rate of 1 per 288 SFT (Roughly 17 FT on center spacing). Species and quantity shall be installed according to the following:

Species	Common Name	Quantity
<i>Acer rubrum</i> (t)	red maple	47
<i>Aesculus glabra</i> (t)	Ohio buckeye	47
<i>Asimina triloba</i> (s)	common paw paw	33
<i>Carya laciniosa</i> (t)	shellbark hickory	47
<i>Cornus alternifolia</i> (s)	alternate-leaf dogwood	33
<i>Cornus racemosa</i> (s)	gray dogwood	33
<i>Ilex verticillata</i> (s)	winterberry	33
<i>Lindera benzoin</i> (s)	common spicebush	33
<i>Quercus bicolor</i> (t)	swamp white oak	47
<i>Quercus macrocarpa</i> (t)	bur oak	47
<i>Quercus palustris</i> (t)	pin oak	47
<i>Quercus shumardii</i> (t)	Shumard oak	47

Tree and shrub planting areas shall be planted with 1-0(1-year) or older air root pruning system container-grown saplings with a dense fibrous root system. The container saplings shall be grown in three- or five-gallon containers or larger. Container saplings shall be a minimum of 3 feet to 6 feet tall with a caliper diameter greater than 3/8-inch. Container saplings shall be selected from the previous list of acceptable species. Substitutions shall be approved by the Engineer.

Trees and shrubs shall be obtained from licensed nursery sources in accordance with Section 914.08 of the INDOT Standard Specifications. A list of suppliers will be furnished to the Owner for approval prior to ordering plant material. All trees and shrubs will be in accordance with Sections 914.08(d) and (e) of the INDOT Standard Specifications. Only that number of trees and shrubs that can reasonably be planted during a single day may be removed from storage. All trees and shrubs will be kept moist during transportation and storage. Trees and shrubs will not be subjected to freezing, drying, or excessive warming.

Seed Mix, Slope Stabilization shall be planted in all areas marked "Seed Mix, Zone A" and applied at a rate of 39.30 LBS/Acre and consist of the following:

Seed Mix, Slope Stabilization (Zone A)		
Scientific Name	Common Name	Oz./Acre
<i>Alisma spp.</i>	water plantain mix	1.00
<i>Andropogon gerardii</i>	big bluestem	24.00
<i>Asclepias incarnata</i>	swamp milkweed	2.00
<i>Aster novae-angliae</i>	New England aster	0.50
<i>Bouteloua curtipendula</i>	side-oats grama	16.00
<i>Carex comosa</i>	bristly sedge	2.00
<i>Carex cristatella</i>	crested oval sedge	1.00
<i>Carex lurida</i>	bottlebrush sedge	2.50
<i>Carex spp.</i>	prairie sedge mix	4.00
<i>Carex vulpinoidea</i>	brown fox sedge	4.00
<i>Coreopsis tripteris</i>	tall coreopsis	1.00
<i>Elymus canadensis</i>	Canada wild rye	18.00
<i>Elymus virginicus</i>	Virginia wild rye	12.00
<i>Eupatorium maculatum</i>	spotted Joe-pye weed	0.25
<i>Glyceria striata</i>	fowl manna grass	1.00
<i>Iris virginica</i>	blue flag	4.00
<i>Liatris spicata</i>	marsh blazing star	1.00
<i>Lobelia cardinalis</i>	cardinal flower	0.25
<i>Lobelia siphilitica</i>	great blue lobelia	0.50
<i>Lycopus americanus</i>	common water horehound	0.25
<i>Panicum virgatum</i>	switch grass	12.00
<i>Sagittaria latifolia</i>	common arrowhead	0.75
<i>Schizachyrium scoparium</i>	little bluestem	32.00
<i>Scirpus atrovirens</i>	dark green rush	2.00

<i>Scirpus cyperinus</i>	wool grass	0.50
<i>Silphium terebinthinaceum</i>	prairie dock	1.00
<i>Sorghastrum nutans</i>	Indian grass	20.00
<i>Spartina pectinata</i>	prairie cord grass	3.00
<i>Verbena hastata</i>	blue vervain	1.50
<i>Zizia aurea</i>	golden Alexander's	0.75
	Sub-Total	168.75
Temporary Cover		
<i>Avena sativa</i>	Common Oat	460.00
	Sub-Total	460.00
	Total Oz./Acre	628.75
	Total Lbs./Acre	39.30

Seed Mix, Native shall be planted in all areas marked "Seed Mix, Zone B" and applied at a rate of 37.03 LBS/Acre and consist of the following:

Seed Mix, Native (Zone B)		
Scientific Name	Common Name	Oz./Acre
<i>Andropogon gerardii</i>	big blue stem	40.00
<i>Angelica atropurpurea</i>	great angelica	1.00
<i>Aster ericoides</i>	heath aster	2.50
<i>Aster puniceus</i>	bristly aster	0.75
<i>Aster umbellatus</i>	flat-top aster	0.25
<i>Calamagrostis canadensis</i>	blue joint grass	5.10
<i>Campanula americana</i>	tall bellflower	0.25
<i>Carex crinita</i>	fringed sedge	2.00
<i>Carex lurida</i>	bottlebrush sedge	1.50
<i>Carex squarrosa</i>	narrow-leaved cattail sedge	1.00
<i>Carex vulpinoidea</i>	brown fox sedge	4.00
<i>Elymus virginicus</i>	Virginia wild rye	10.00
<i>Helenium autumnale</i>	sneezeweed	2.00
<i>Heracleum lanatum</i>	cow parsnip	0.75
<i>Leersia oryzoides</i>	rice cut grass	2.00
<i>Lobelia siphilitica</i>	great blue lobelia	1.50
<i>Lycopus americanus</i>	common water horehound	0.25
<i>Mimulus ringens</i>	monkey flower	1.25
<i>Monarda fistulosa</i>	prairie bergamot	1.00
<i>Panicum virgatum</i>	switch grass	2.50
<i>Polygonum spp.</i>	smartweed mix	0.50
<i>Ratibida pinnata</i>	yellow coneflower	4.40
<i>Rudbeckia hirta</i>	black-eyed Susan	1.90
<i>Rudbeckia laciniata</i>	wild golden glow	2.50
<i>Rudbeckia subtomentosa</i>	sweet black-eyed Susan	1.60

<i>Silphium laciniatum</i>	compass plant	3.80
<i>Silphium terebinthinaceum</i>	prairie dock	2.50
<i>Solidago juncea</i>	early goldenrod	2.50
<i>Solidago rigida</i>	stiff goldenrod	2.50
<i>Solidago rugosa</i>	rough goldenrod	3.20
<i>Sorghastrum nutans</i>	Indian grass	2.50
<i>Spartina pectinata</i>	prairie cord grass	7.60
<i>Verbesina alternifolia</i>	wingstem	14.00
<i>Vernonia altissima taeniotricha</i>	hairy tall ironweed	3.80
	Sub-Total	132.90
Temporary Cover		
<i>Avena sativa</i>	Common Oat	460.00
	Sub-Total	460.00
	Total Oz./Acre	592.90
	Total Lbs./Acre	37.06

Comparable seed mixes to those listed above may be substituted with the approval of the Engineer. Each species specified shall be applied at a rate equal to or greater than that listed in the mixtures unless approved by the engineer. If a species listed in the seed mixture is not available notify the engineer and present a proposal for the use of a substitute species.

Construction Requirements

Preparation of the site for seeding shall consist of a 2-phase process of herbicide application to eliminate existing seed sources of undesirable volunteer species. The first phase shall consist of applying herbicide to all planting areas (Zone A and Zone B) within the mitigation site as identified on the plans. The second phase shall commence once young developing weeds show and shall consist of a second herbicide application to the entire planting area. Contractor shall follow manufacturer's recommendations for herbicide application rates.

Seeding shall be performed by no-till drill method. Seed shall be installed directly into the thatch left by existing ground cover. Temporary seed can be omitted from the seed mix where the existing ground cover is determined to be at least 70 percent. In newly graded areas, temporary seed and erosion control blanket shall be applied in conjunction with seeding operations and in accordance with 621.03 and 621.04.

Where topsoil has been stripped due to grading operations, six to twelve inches of topsoil shall be replaced. Topsoil shall be lightly compacted to the planned elevation.

Seeding shall be performed from September 15 to November 30, and/or March 15 to May 15. Seeding performed outside of these dates shall be approved by the engineer.

Water shall be supplied at 27 kGAL per acre to provide an equivalent 1 inch of water over the entire seeding area. Watering shall be performed a minimum of two times unless soil conditions prohibit watering.